A File Structure for The Complex, The Changing and the Indeterminate

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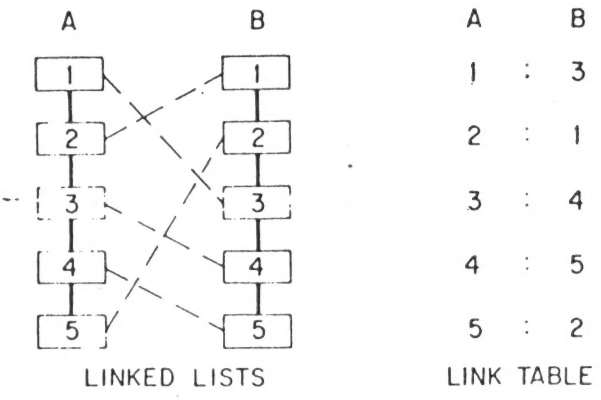


***FIGURE 1*—Zippered lists: 1-for-1 links between entries are invariant under list permutation.**

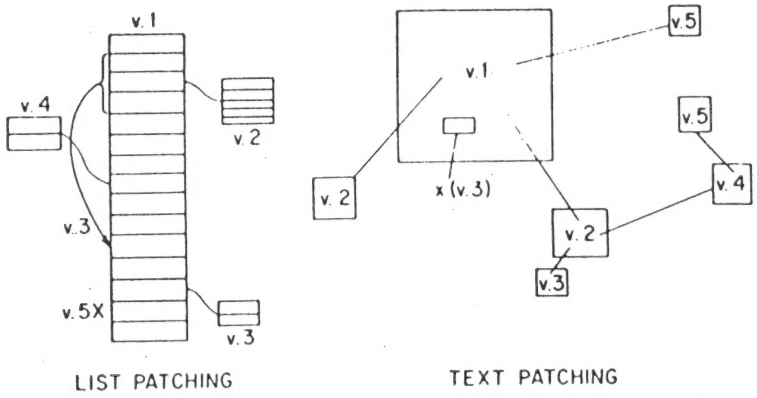


***FIGURE 2*—Spinoff of variants: extra versions need little space.**

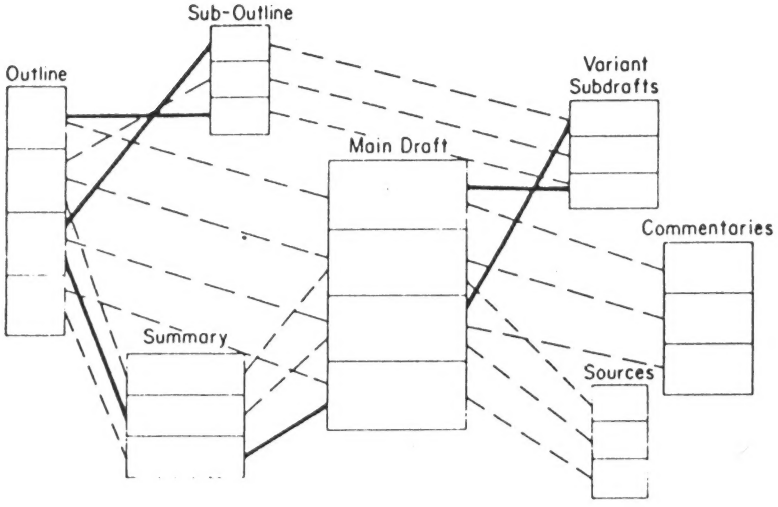


***FIGURE 3*— All levels of documentation may be contained in the ELF. (Heavy lines indicate that linked entries are identical.)**

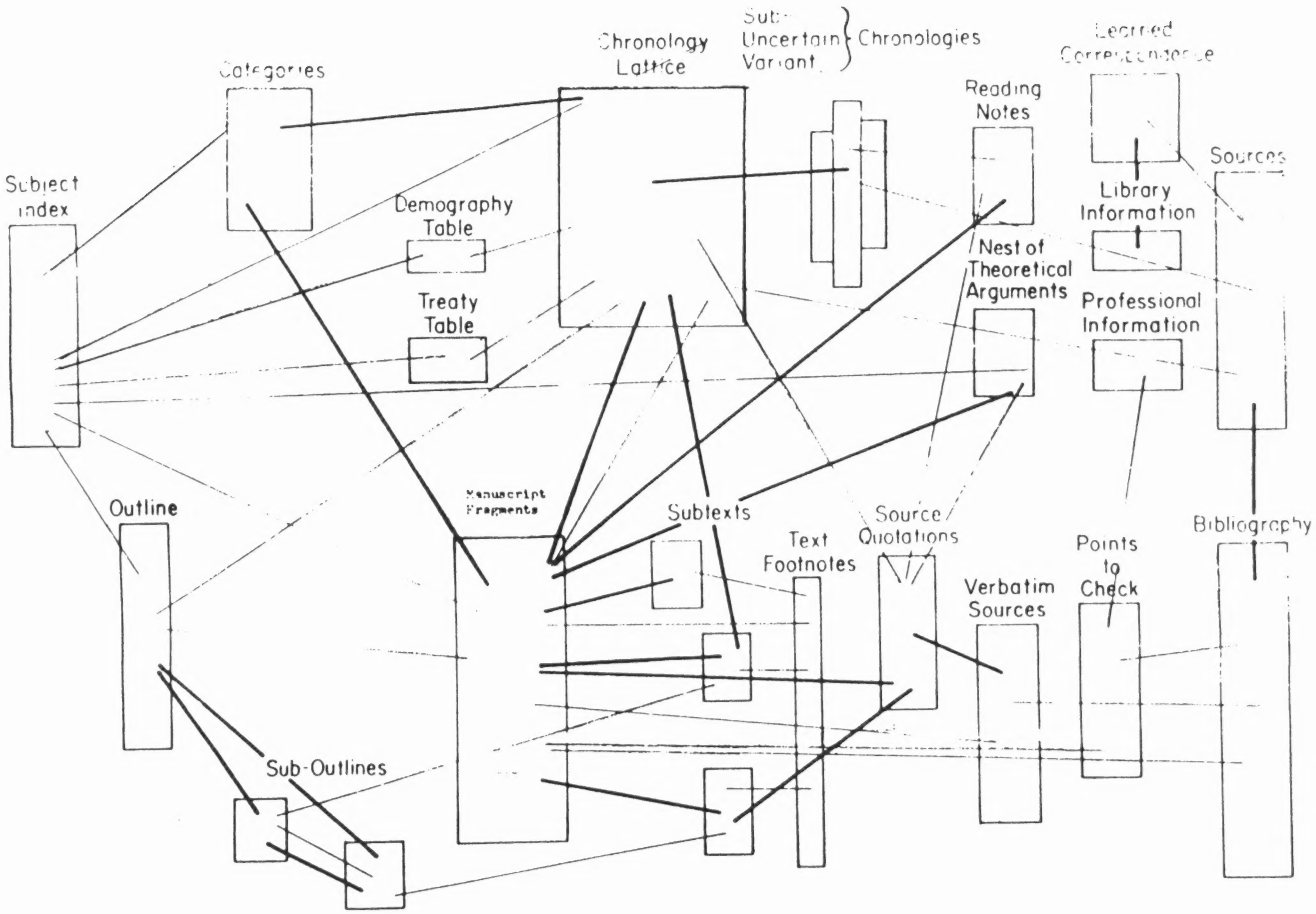


FIGURE 4– ELF's capacity for total filing: hypothetical use by historian. (A thin line indicates the presence of links; a heavy line indicates that some linked entries are identical.)

Handout for Hypertext 93 Conference, Seattle. LOMM d5 93.11.14
Ted Nelson, Xanadu™ On-Line Publishing, 3020 Bridgeway #295, Sausalito CA 94965. Fax 415/332-0136

THE LOGIC OF METAMEDIA

THE TRAGEDY OF CLOSED MEDIA.

Closed media, unusable together, unable to quote from or link to one another, are creating a Balkanized world of electronic media. Whereas what we need is *on-line media with compatible connections*-- for scholarship, controversy, anthologizing, understanding, the reworking of ideas, and freedom.

THEY DON'T UNDERSTAND WHAT WE NEED--

A Point-and-click universe. We want to be able to jump from document to document, like a squirrel from branch to branch, passing through one document on the way to another, purchasing just that moment's portion.

Networked interwoven documents. We need to be able to treat the network as a seamless whole, and the contents as a unified docuverse.

Royalty. Owners need to be paid. Copyright is not an imposition; it is the compromise under which things are made available. The new system must extend it inconspicuously and innocuously.

Open hypermedia publishing. Everyone must be free and equal to publish, to comment, to publish links, to quote. Quotation can work within the copyright system, by purchasing the quotation from the document of origin.

Compatibility. Enough of this hardware incompatibility hogwash! We need compatible *data*, to which the hardware is a window.

Connectedness. Any document must be able to connect to any other.

Stability. We need to know the material will be addressable in the same form and the same way, decades from now.

A Populist System. This cannot just be for the wireheads, early adopters, elite; it must be accessible to all.

THEREFORE WE START OUR OWN UNIVERSE.

CONCLUSION: THESE PREMISES LEAD TO A NEW PLAYING FIELD:

Open-ended technology, capped by trademark: a variety of database methods can implement this publishing model, in a mix of assured upward compatibility.

Defined by contract. Participants agree to unusual terms of sale, etc. No rights are relinquished by participants *except within this closed system.*

Promise of stability. Publisher and vendor agree to keep material in the repository.

Minute sale. Sale is interactive and on request, with royalty even on tiny portions.

Clean royalty. Proportional on every piece bought by user.

Arbitrary links. Any type of connection, from an expansible list of link types.

Quotation. Transclusion, or virtual instance pointer, says "buy from there."

TECHNICALITIES--

Harpoon table. Inbound links and transclusion pointers are stored also with the destination document; this storage is paid for by those who point.

Local caching of transclusions. Quoted material may be stored with a new document, still owned by original publisher, but storage paid for by new publisher.

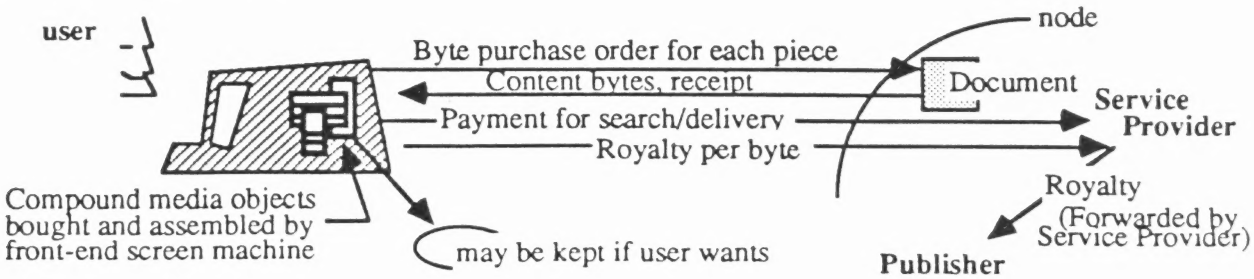
MEDIA FOR A POINT-AND-CLICK UNIVERSE:

A system for selling bytes on line, with open interconnectivity.

XANADU™ PUBLISHING IN BRIEF

PUBLISHER PAYS FOR STORAGE, READER PAYS FOR DELIVERY, including small royalty to publisher per byte.

READER MAY SEND FOR ANY PORTION, often a small increment, or linked material in another document.



ANYONE MAY QUOTE ANYTHING in the Xanadu network by transclusion (virtual inclusion), meaning: "buy that part over there"-- from another publisher's document.

ANYONE MAY PUBLISH LINKS TO ANYTHING in the Xanadu network (comments, endorsement, illustration, disagreement...)

EVERY DOCUMENT IS OWNED; publisher pays for storage.

EVERY LINK IS OWNED as part of some document.

CONNECTING TO ONE XANADU NODE CONNECTS YOU TO ALL-- all nodes and documents and data objects.

ALL DATA STRUCTURES ARE WELCOME and connectable; there are no closed objects.

COPYRIGHT.

Copyright and royalty are automatic and unobtrusive. Publisher automatically receives royalty from user on every byte bought by user; publisher sets this royalty rate. (Service charges are separate.)

All bytes sent to reader are deemed to be purchased, since system cannot distinguish between "preview" and "downloading."

Reader's purchase of bytes includes the right to backup and one printout. (Additional arrangements are easily made.)

RIGHTS AND DUTIES BY CONTRACT.

READER agrees to terms of sale.

PUBLISHER claims right to publish the specific material. Publisher assumes legal responsibility for contents (THIS IS THE LEGAL DEFINITION OF "PUBLISHER"). Xanadu service provider, like a printer, is not involved with contents. Publisher relinquishes any rights to control transclusion, linkage, sequence of purchase, or size of purchase.

XANADU SERVICE PROVIDER promises integrity of document and correct delivery of contents and royalties.

FOR CONTRACTS AND FURTHER INFORMATION, send SASE to Xanadu On-Line Publishing, 3020 Bridgeway #295, Sausalito CA 94965.

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XANADU™ REPOSITORY PUBLISHING
A NEW FORM OF ELECTRONIC DELIVERY PROMISES WORLD-WIDE IMPACT IN THE MID-NINETIES

The copyright issue has become vexing to all parties-- publishers, users, and especially computer sophisticates.

Publishers feel threatened by ease of duplication and what they see as lost revenue; but they see as well the vast potential of electronic media. Users are frustrated by publishers' efforts to thwart reasonable varieties of use for different purposes.

We propose TRUE ELECTRONIC PUBLISHING: the customer buys information as electrons coming down the wire, not crammed into a physical object. Our method provides an integrated solution to distribution, copyright, royalty, credit, linkage and versioning.

Royalty will be automatic by the small fragment-- not by the full document, but by the sliver-- since in tomorrow's hypertext world there's no telling where the user will want to go next. THE FUTURE OF HUMANITY IS AT THE COMPUTER SCREEN. (over)

WHO MAY PUBLISH

Conventional publishing firms; individuals; corporations; universities; even governments.

WHAT MAY BE PUBLISHED

Text in any format; graphics in any format; audio in any format; sheet music; video; computer data; computer programs; comments; etc. etc.

THE MAGIC OF TRANSCLUSION

Materials already on the network may be included in your document without copying them; they are supplied anew to each user from the original.

This assures royalty and credit to the correct originator of each fragment.

PROJECTED TIMETABLE

1993: first Public-Access Xanadu™ franchised stands in Northern California and Country 2.

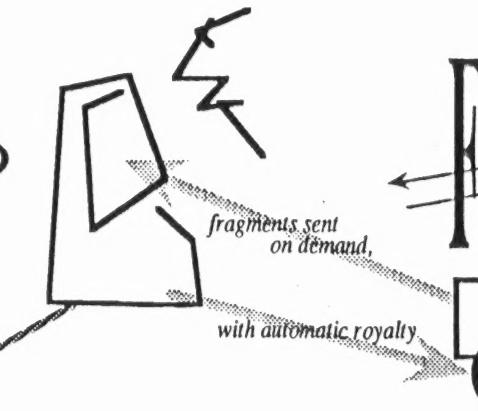
1994: Public-Access Xanadu services in four U.S. states, four countries.

1996: franchised Public-Access Xanadu service extended worldwide.

THE NETWORK

Licensed Xanadu storage vendors are connected through available networking channels.

Licensed Xanadu storage vendors maintain availability and integrity of published material. By connecting to one storage vendor, the user may access anything stored in the network.



FRAGMENT SERVICE

Each document has a cash register. At each delivery of a fragment from a stored document, a small royalty payment goes from the user's account to the document's cash register. This buys fair use of the fragment so purchased, which the user may discard, keep on disk or print out.

REPOSITORY PUBLISHING WITH ROYALTY

It is clear that interactive document feed from public-access repositories will soon become a major form of publishing. This means sending materials across networks to users as they demand them. More important than the technical issues in delaying these developments have been the social and psychological issues: copyright, royalty, responsibility for contents, and the complexity that so many computer people imagine to be necessary.

A unified solution is in sight: a great public-access document repository with automatic royalty on every fragment sent to a user. This has long been a principal goal of the legendary Xanadu project, now divided into two companies. XOC, Inc.* will soon bring out a hypermedia server program for industry. PAX plans to create the great repository by running this same server program in many connected computers.

Because a long-term objective of the Xanadu team has been a seamless, world-wide on-line publication system for the 21st Century, *the software has been explicitly designed for this service,* with certain unique features that will be necessary as the numbers of documents, server machines and users grow very large.

PAX™ (Public-Access Xanadu™) holds unique rights to the Xanadu software for the long-awaited royalty publishing scheme, which will be licensed world-wide as the program to maintain people's connections among ever-changing electronic documents.

VITAL FEATURES OF **REAL** ELECTRONIC PUBLISHING

OPERATIVE ACROSS ALL TRANSMISSION SYSTEMS
DESIGNED FOR HIGH-POWER SCREEN MACHINES
INTEGRITY OF ORIGINAL ALWAYS MAINTAINED
ROYALTY AUTOMATIC ON EVERY FRAGMENT DELIVERED
NOTHING MISQUOTED (always taken from original)
NO QUOTE OUT OF CONTEXT (original context always available)
PERMISSIONS UNNECESSARY FOR ON-LINE QUOTATION
(since quoted matter is not copied)
STABILITY OF LINKS AS VERSIONS CHANGE

THE LICENSING SYSTEM

Public-Access Xanadu (PAX) will create the repository network by licensing and maintaining standards. PAX will be a multinational licensing corporation; its regional divisions will license individuals and companies to operate the network's storage and feeder machines. These participating members of the repository network we refer to as *storage vendors;* their feeder machines will store the documents and send out the document fragments on demand, manage the billing to users, and manage the corresponding royalties to publishers.

Just as today's paper publishers now contract with printers, tomorrow's on-line publishers will contract with Xanadu storage vendors. (PAX will not itself take publishing initiatives.)

Note that the basic information on PAX licensing and contracts are to be found in *Literary Machines,* chapters 5.

FOR GENERAL INFORMATION ABOUT XANADU™ CONCEPTS, absorb the following from Mindful Press, 3020 Bridgeway, Sausalito CA 94965, tel. 415/ 331-4422: *Literary Machines* by Theodor Holm Nelson ($25 in USA, $40 elsewhere, $5 for purchase order) or **"Technical Overview of the Xanadu Hypertext System,"** VHS videotape ($50 in USA, $65 elsewhere, $5 for purchase order).

To get on the mailing list for PAX developments, write to Public Access Xanadu, 3020 Bridgeway #295, Sausalito CA 94965. Parties in Europe may wish to discuss these matters with our EC representative, Elisabeth Davenport (c/o Department of Information Science, University of Strathclyde, Glasgow; tel. 041-552-4400 x3700; fax 041-553-1393).

THE X™
INTERACTIVE MASS MEDIUM™

ATTENTION SOFTWARE DEVELOPERS: FOR INFORMATION ON XANADU SOFTWARE AND HOW TO CONNECT TO IT, contact Xanadu Operating Company,* 550 California Avenue, Palo Alto CA 94306; tel. 415/ 856-4112; fax 415/ 856-2251.

A CLARIFYING SYSTEM OF ORDER

Xanadu is a whole world: a way of thinking, a way of relating to documents, a way of creating and delivering a whole new literature. It is not like small-scale hypertext programs, which allow the creation only of individual documents; it is a universal approach to the creation, melding and delivery of vast numbers of documents with different points of view, eventually merging them all into a new electronic literature for much of the planet.

NO LAWS NEEDED

Xanadu publishing is designed for the voluntary participation of publishers and users. The contract is independent of a document's other uses: Xanadu publishing requires only an agreement to sell fragments through a storage vendor for a minimum of three years, plus a payment by the publisher of small storage and registration fees to the storage vendor. All delivery charges are paid by the inquiring user at the instant of delivery.

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